THERAPEUTIC ADVANCES in
Vaccines and Immunotherapy

Letter to the Editor

Vaccine apartheid: the separation of the world's poorest and most vulnerable and the birth of Omicron

Ther Adv Vaccines Immunother

2022, Vol. 10: 1–5

DOI: 10.1177/25151355221107975

© The Author(s), 2022.
Article reuse guidelines: sagepub.com/journals-permissions

Sakshi Prasad, Abia Shahid, Edzel Lorraine F. Co, Govinda Khatri, Huzaifa Ahmad Cheema, Ian Christopher N. Rocha, Mainak Bardhan and Mohammad Mehedi Hasan

Dear Editor,

In the 71st session of the Regional Committee for Europe, Dr. Tedros A. Ghebreyesus, the Director General of the World Health Organization (WHO), pointed out that 'the longer vaccine inequity persists, the more opportunity the virus has to circulate and change into variants that could potentially evade vaccines'.[1] The recent global outbreak of Omicron is exactly what Dr. Tedros feared.[2] Therefore, the quickest way out of the coronavirus disease 2019 (COVID-19) pandemic is to inoculate the most vulnerable people in all countries while aiming to contain the virus and preventing it from changing into more transmissible variants.

Apartheid comes from the Afrikaans word meaning 'the state of being apart' or 'separateness' which describes the systematic institutionalized racial discrimination that was present in Southwest Africa and South Africa.[3] This state of 'separateness' from vaccine access and programs for low- to middle-income countries (LMICs) in this pandemic reminisces strongly about the situation in South Africa back in 1948. Since December 2020, the introduction of vaccines gave us the hope and promise of resolution of the pandemic. Although many high-income countries (HICs) were making gradual progress in reducing severe outcomes against COVID-19 via vaccination, LMICs especially in the poorest countries across the world are still facing the wrath of the virus due to vaccine inequity.

With the wealthiest nations still controlling the vaccine's production and distribution rights, third-world countries are encountering debilitating economic, social, and health-associated aftermaths with WHO-mediated COVID-19 Vaccines Global Access Initiative (COVAX) doing little to aid them. The impact of this separateness will resonate deeply into the collective fabric of these countries, increasing the geo-political and financial inequity between wealthy and poor even more.[4]

The WHO and the rich nations must take an initiative to eradicate the inequality that is present in COVID-19 vaccine availability in less-developed countries. Unlike other global epidemics like human immunodeficiency virus (HIV), tuberculosis, malaria, dengue, and Zika, COVID-19 cannot be let go just because the pandemic is contained from the borders of high-income nations. The virus will mutate with newer variants that might not be effectively covered by the current vaccines available should the global situation remain as it is. In the words of the WHO Director General, 'the world is on the brink of a catastrophic moral failure and the price of this failure will be paid with the lives and livelihoods in the world's poorest countries. No one is safe until everyone is safe'.[5]

Vaccine apartheid: background

The inequitable distribution of vaccination in the case of the COVID-19 pandemic appears to be a relatively new problem but this 'apartheid' has prevailed for a longtime. With the examples from the past of pandemics like HIV at the end of the 20th century and the swine flu pandemic of 2009, this outcome was expected. The WHO Director General reminisced about these pandemics and how the anti-retroviral drugs for HIV reached the LMICs 10 years after their discovery resulting in the prolongation of the HIV crisis in the Global South. This was followed by the H1N1 influenza

Correspondence to:
Mohammad Mehedi Hasan
Department of Biochemistry and Molecular Biology, Faculty of Life Science, Mawlana Bhashani Science and Technology University, Tangail 1902, Bangladesh.
mehedi.bmb.mbstu@gmail.com

Sakshi Prasad
National Pirogov Memorial Medical University, Vinnytsya, Ukraine

Abia Shahid
Huzaifa Ahmad Cheema
Department of Medicine, King Edward Medical University, Lahore, Pakistan

Edzel Lorraine F. Co
Faculty of Medicine and Surgery, University of Santo Tomas, Manila, Philippines

Govinda Khatri
Dow University of Health Sciences, Karachi, Pakistan

Ian Christopher N. Rocha
School of Medicine, Centro Escolar University, Manila, Philippines

Mainak Bardhan
Division of Bacteriology, ICMR-National Institute of Cholera and Enteric Diseases, Kolkata, India

Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 License (https://creativecommons.org/licenses/by-nc/4.0/) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).

pandemic, in 2009, where similar circumstances developed.[6] Tedros called these incidents a 'global failure'. Similarly, WHO's Chief Scientist Swaminathan also recalls how these inequalities hark back to the 1990s when she saw her HIV patients in India die when the drugs were saving lives in the west.[7]

Although COVAX, a worldwide initiative aimed at equitable access to COVID-19 vaccines, co-led by Gavi, the Coalition for Epidemic Preparedness Innovation (CEPI), and the WHO, was launched to ensure this segregation is not carried into the current pandemic, it does not seem to be anywhere near achieving its goal. The major reasons for it are disparity in vaccine deployment infrastructure of HICs and LMICs, the prevalence of vaccine nationalism, and the facility's at-risk funding strategy.[8,9] Swaminathan, WHO's Chief Scientist says that COVAX was a beautiful idea that failed to deliver its goal because none of the manufacturers prioritized it.[10]

India and South Africa proposed at the World Trade Organization to temporarily suspend the intellectual property rights of the COVID-19 vaccines. However, they were met with resistance from many of the HICs like the United Kingdom, Canada, and the European Union. These countries have procured 8.2, 10.1, and 6.9 doses of COVID-19 vaccines respectively for each individual as of December 2020.[11] On the contrary, LMICs like Cambodia, Pakistan, Mauritius, Albania, Ecuador, Guyana, and Bolivia had received less than 0.1 doses as of February 2021.[12] In these times, much is to be learned from mankind's triumph against the poliovirus. In the early 1950s, Dr. Jonas Salk first made the Salk vaccine. Later when asked who owned the patent for it, he said 'The people, I would say. There is no patent. Could you patent the sun?' The disease has been completely eradicated from the world since then, with the polio vaccines being part of mandatory vaccination schedules across the globe. There were only 32 reported cases of Polio in 2021 comparison to more than 60,000 cases of death and paralysis in 1950s from polio in United States alone.[13]

In recent times, the outbreaks of Ebola virus disease, Lassa fever, hantavirus, the emergence of multidrug-resistant tuberculosis, severe acute respiratory syndrome (SARS), and other diseases have transcended national boundaries. These examples should work to further strengthen the narrative that 'no one is safe until everyone is safe'.[14]

Global scenario: consequences

Amid the application of COVAX to address the prevailing gap on equitable access to COVID-19 vaccines between HICs and LMICs, there is still an unequal allocation of vaccines. According to Our World in Data, at least one dose of the COVID-19 vaccination has been given to 65.7% of the world's population. Globally, 11.74 billion doses have been administered, with 7.24 million doses being administered every day. In low-income nations, just 15.9% of people have received at least one dosage, as of 19 May 2022.[15] The first-world countries have been focusing on developing and rolling out COVID-19 vaccines to protect their own populations first, rather than sharing the vaccines for the sake of all mankind. For example, the low vaccination rates in the LMICs pose another pressing issue that contributes to the affordability of the rollout of COVID-19 vaccines to these countries.[2] The rampant increase of COVID-19 cases in India contributed to an increased demand for vaccines and a limitation in the manufacturing capacity of vaccines globally. The allocation of these vaccines to this country have been redirected toward the domestic market, and hence, another repercussion worldwide.[16]

If this situation keeps going on with a slow pace of vaccination rate, there will still be millions of unvaccinated people at high risk of facing the consequences of COVID-19 pandemic (deaths, burdened healthcare infrastructure, and record high physician burnouts).[17] With the continuing prevalence of SARS-CoV-2 and the advent of new variants of this virus that have the potential to have immune evasions, such as Alpha (B.1.1.7), Beta (B.1.351), Gamma (P.1), Delta (B.1.617.2), Epsilon (B.1.427/B.1.1429), Zeta (P.2), Eta (B.1.525), Theta (P3), Iota (B.1.526), Kappa (B.1.617.1), and Omicron (B.1.1.529), it is highly likely that another emergence of pandemics will happen.[18,19] This vaccine apartheid is a reflection of the failure of wealthy nations to equally distribute the sources of COVID-19 vaccines globally. Normality is slowly coming back to vaccine front-runners like the United Kingdom,

Israel, and United States, but in developing countries like India, the health system is still buckling under pressure with many recorded deaths every day.[20] This however in the longer run might pose serious problem to HICs; as the virus continues to mutate, there is a possibility of the current vaccines being less effective against it.

The way ahead

HICs vaccinate an exceedingly large portion of their populations, stocking up on vaccines, their boosters, boosters on boosters, and while this may help them contain the virus preventing any major outbreaks within their own borders but the countries with limited vaccine coverage like Yemen, Syria, and countries from the midsection of Africa including Senegal are now pushing their entire health infrastructure and professionals to their limits beyond which a complete collapse is imminent.[21–23] In an open letter appeal to G20 summit leaders, the disparity between access to vaccines between HICs and LMICs were brought to everyone's attention. It stated that there were only four doses per a hundred people in LMICs in comparison to an extra 133 doses per hundred in HICs.[24] It should be a strong point in argument that, for their own self-interests, rich countries should help disseminate vaccines broadly. The lead policy and geo-political leaders of the country should be educated and made aware of the established link between vaccine apartheid and mushrooming of new variants, which each time will create a new wave of infections, hospitalization, and mortality, unsettling their local equilibrium. Since there is a constant risk of infection among even vaccinated immuno-compromised and geriatric population, the developed nations hold as much as an equal threat of giving birth to the next variant with lesser vaccine coverage as LMICs.[25] Since neither of the current vaccines provides a definite immunity against the infection, even more so with the recent variants of delta and Omicron, the probability of the virus mutating into a more infectious genome is higher even in highly vaccinated populations.[26]

The most efficient and long-term solution to this apartheid is working toward strengthening the infrastructure in the LIMCs. It is clear from this pandemic that LMICs need to build local and regional capacity and infrastructure as relying on the conscience, morality, and excess vaccine production of HICs for this or future pandemics will be a risk not worth taking. The African Vaccine Manufacturing Initiative 'Vaccine Manufacturing and Procurement in Africa (VMPA)' in 2017 reported approximately 100% importation of all kinds of vaccines to Africa.[27] In a striking contrast to the call by WHO to support local manufacturing of flu vaccines,[28] the number of local vaccine manufacturers has fallen down from 55 countries two decades ago to less than 20 in 2017.[27]

International initiatives working currently to disseminate vaccines to the ones in need can also aid in providing sustained efforts and guidance to prevent such episodes of mass vaccine production falling in the hands of few profit-driven commercial entities. The International Monetary Fund has begun investing in vaccine production in Africa, stating it is 'good for the world', since the price of investment is miniscule in contrast to the global economic and financial losses of COVID-19.[29] Investment however shall not be replaced with loans since it only perpetuates indebtedness.

Conclusion

Vaccine apartheid, the inequitable distribution of vaccines leading to lower vaccination rates in LMICs, has been well-documented in the past pandemics.[30] Unfortunately, mankind has failed to learn from its past mistakes leading to history being repeated in the context of the current COVID-19 pandemic. The hoarding of vaccines by the HICs and ineffective and discriminating government policies of the LMICs have contributed to this apartheid. Several LMIC countries introduced the lockdown measures very late into the pandemic and failed to implement these measures effectively. The vaccines, when introduced in a few countries, were initially hoarded for the influential members of society before being fairly administered to healthcare workers and the geriatric population. Furthermore, there were no rules about whether the foreigners present in any country at the time could access the vaccines. The consequences of these will be seen as worsening of the pandemic leading to unnecessary loss of lives, and birth of newer, more virulent variants like the Omicron. In addition, this

will place more socioeconomic strain on the LMICs. To rectify this situation, initiatives must be taken involving the HICs to export their stockpiled vaccines to other countries. Higher authorities, like the WHO, should step in to roll out worldwide vaccine distribution programs and ensure that HICs adhere to these programs to prevent repeating failures. Furthermore, the establishment of an independent regulatory body is needed to check and regulate pharmaceutical companies to avert intellectual property rights over the vaccines (especially amid pandemics), and making exclusive deals with HICs. If the lessons from history are to be learned, everyone involved shall be reminded of their moral obligation and the fact that further aggravation of the pandemic will cause global harm, which is not limited to LMICs.

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Author contributions
Sakshi Prasad: Data curation; Writing – original draft; Writing – review & editing.

Abia Shahid: Data curation; Writing – original draft.

Edzel Lorraine F. Co: Data curation; Writing – original draft.

Govinda Khatri: Data curation; Writing – original draft; Writing – review & editing.

Huzaifa Ahmad Cheema: Data curation; Writing – original draft.

Ian Christopher N. Rocha: Writing – review & editing.

Mainak Bardhan: Writing – review & editing.

Mohammad Mehedi Hasan: Conceptualization; Project administration; Resources; Supervision; Writing – review & editing.

ORCID iDs
Govinda Khatri https://orcid.org/0000-0002-7233-753X

Mohammad Mehedi Hasan https://orcid.org/0000-0002-3871-889X

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of interest statement
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Availability of data and materials
Not applicable.

References
1. WHO Director-General's opening remarks at the 71st session of the Regional Committee for Europe, https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-71st-session-of-the-regional-committee-for-europe (2021, accessed 21 February 2022).
2. Petersen E, Ntoumi F, Hui DS, *et al.* Emergence of new SARS-CoV-2 variant of concern Omicron (B.1.1.529) – highlights Africa's research capabilities, but exposes major knowledge gaps, inequities of vaccine distribution, inadequacies in global COVID-19 response and control efforts. *Int J Infect Dis* 2022; 114: 268–272.
3. Lanziotti VS, Bulut Y, Buonsenso D, *et al.* Vaccine apartheid: this is not the way to end the pandemic. *J Paediatr Child Health* 2022; 58: 228–231.
4. Oehler RL and Vega VR. Conquering COVID: how global vaccine inequality risks prolonging the pandemic. *Open Forum Infect Dis* 2021; 8: ofab443.
5. WHO Director-General's opening remarks at 148th session of the Executive Board, https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-148th-session-of-the-executive-board (2021, accessed 11 February 2022).
6. 'I'm still feeling that we're failing': exasperated WHO leader speaks out about vaccine inequity | Science | AAAS', https://www.science.org/content/article/i-m-still-feeling-we-re-failing-exasperated-who-leader-speaks-out-about-vaccine (2021, accessed 11 February 2022).
7. Haunted by HIV, top WHO scientist says world must do better on COVID. *France* 24, 19 May 2021, https://www.france24.com/en/

live-news/20210519-haunted-by-hiv-top-who-scientist-says-world-must-do-better-on-covid (accessed 11 February 2022).

8. Riaz MMA, Ahmad U, Mohan A, *et al*. Global impact of vaccine nationalism during COVID-19 pandemic. *Trop Med Health* 2021; 49: 101.
9. Eccleston-Turner M and Upton H. International collaboration to ensure equitable access to vaccines for COVID-19: the ACT-accelerator and the COVAX facility. *Milbank Q* 2021; 99: 426–449.
10. Vaccinate 40% people everywhere before rolling out booster doses: Soumya Swaminathan, https://www.downtoearth.org.in/news/health/vaccinate-40-people-everywhere-before-rolling-out-booster-doses-soumya-swaminathan-77885 (2021, accessed 11 February 2022).
11. Usher AD. South Africa and India push for COVID-19 patents ban. *Lancet* 2020; 396: 1790–1791.
12. Acharya KP, Ghimire TR and Subramanya SH. Access to and equitable distribution of COVID-19 vaccine in low-income countries. *npj Vaccines* 2021; 6: 54.
13. Davis BG. Could you patent the sun? *ACS Cent Sci* 2021; 7: 508–509.
14. Gavi, the Vaccine Alliance. No one is safe until everyone is safe, https://www.gavi.org/vaccineswork/no-one-safe-until-everyone-safe (2021, accessed 19 May 2022).
15. Our World in Data. Coronavirus (COVID-19) vaccinations, https://ourworldindata.org/covid-vaccinations (2022, accessed 19 May 2022).
16. Massinga Loembé M and Nkengasong JN. COVID-19 vaccine access in Africa: global distribution, vaccine platforms, and challenges ahead. *Immunity* 2021; 54: 1353–1362.
17. Dhawan M, Sahni A and Choudhary OP. Vaccine inequity and hesitancy: dual factors in the emergence of novel SARS-CoV-2 variants. *Ann Med Surg* 2022; 73: 103186.
18. Choudhary OP, Ali RK, Maulud SQ, *et al*. Will the next spillover pandemic be deadlier than the COVID-19? A wake-up call. *Int J Surg* 2022; 97: 106208.
19. Hasan MM, Rocha ICN, Ramos KG, *et al*. Emergence of highly infectious SARS-CoV-2 variants in Bangladesh: the need for systematic genetic surveillance as a public health strategy. *Trop Med Health* 2021; 49: 69.
20. Cohen J. Rich countries cornered COVID-19 vaccine doses. Four strategies to right a 'scandalous inequity'. *Science*, 27 May 2021, https://pulitzercenter.org/stories/rich-countries-cornered-covid-19-vaccine-doses-four-strategies-right-scandalous-inequity
21. Devex. Yemen's health system is hanging 'on a cliff', https://www.devex.com/news/yemen-s-health-system-is-hanging-on-a-cliff-102543 (2022, accessed 19 May 2022).
22. ReliefWeb. Healthcare system on the brink of collapse as new wave of COVID hits Northwest Syria. *Syrian Arab Republic*, https://reliefweb.int/report/syrian-arab-republic/healthcare-system-brink-collapse-new-wave-covid-hits-northwest-syria (2022, accessed 19 May 2022).
23. In Senegal, demand for COVID vaccines grows, but they're hard to get. *The New York Times*, 18 September 2021, https://www.nytimes.com/2021/09/18/world/africa/covid-vaccine-senegal.html (accessed 19 May 2022).
24. An appeal to G20 leaders to make vaccines accessible to people on the move, https://www.who.int/news/item/29-10-2021-an-appeal-to-g20-leaders-to-make-vaccines-accessible-to-people-on-the-move (2021, accessed 19 May 2022).
25. Choi B, Choudhary MC, Regan J, *et al*. Persistence and evolution of SARS-CoV-2 in an immunocompromised host. *N Engl J Med* 2020; 383: 2291–2293.
26. Hunter DJ, Karim SSA, Baden LR, *et al*. Addressing vaccine inequity – COVID-19 vaccines as a global public good. *N Engl J Med* 2022; 386: 1176–1179.
27. African vaccine manufacturing initiative VMPA study: vaccine manufacturing and procurement in Africa, https://www.avmi-africa.org/wp-content/uploads/2017/09/VMPA-Study-e-book.pdf (2017, accessed 20 March 2022).
28. World Health Organization. Global action plan for influenza vaccines: global progress report 2006–2016, https://api.healthsecuritynet.org/get/file/9789241515634-eng.pdf?id=1137 (2019, accessed 20 March 2022).
29. Georgieva K. Support for Africa's vaccine production is good for the world. *IMF Blog*, 12 January 2022, https://blogs.imf.org/2022/01/12/support-for-africas-vaccine-production-is-good-for-the-world/ (accessed 20 March 2022).
30. Ye Y, Zhang Q, Wei X, *et al*. Equitable access to COVID-19 vaccines makes a life-saving difference to all countries. *Nat Hum Behav* 2022; 6: 207–216.

Visit SAGE journals online journals.sagepub.com/home/tav

SAGE journals